

Now find $g(f(2))$

$$f(x) = 2x - 7$$

$$f(2) = 2(2) - 7$$

$$f(2) = 4 - 7$$

$$= -3$$

$$g(x) = x^2 + 4$$

$$g(-3) = (-3)^2 + 4$$

$$= 9 + 4$$

$$= 13$$

$$\text{So... } g(f(2)) = 13$$

What do the solutions of $f(g(2))$ and $g(f(2))$ tell you about the order of evaluating functions?

Example 2

$$\text{Let } f(x) = x^2 + 4 \text{ and } g(x) = x + 2$$

a. find $(g \circ f)(x)$

$$g(x) = (x) + 2$$

$$(g \circ f)(x) = (x^2 + 4) + 2$$

$$(g \circ f)(x) = x^2 + 6$$

b. Find $(f \circ g)(x)$

$$f(x) = x^2 + 4$$

$$= (x+2)^2 + 4$$

$$= (x+2)(x+2) + 4$$

$$= x^2 + 4x + 4 + 4$$

$$(f \circ g)(x) = x^2 + 4x + 8$$

Ex 3 Let $f(x) = 2x - 7$ and $g(x) = x^2 + 4$
What is the value of $f(g(2))$?

① Start w/ the inner most function
(closest to the 2)

② substitute the value into the innermost function

$$g(x) = x^2 + 4$$

$$g(2) = (2)^2 + 4 = 8$$

③ substitute the value from step 2 into the outer function

$$f(x) = 2x - 7$$

$$= 2(8) - 7$$

$$= 16 - 7$$

$$f(g(2)) = 9$$